Design and Build the Kuyngebasreng Website Using the Waterfall Method

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Abstract

The transformative impact of digital technology and the internet on the business landscape cannot be overstated, particularly in the realm of product marketing and promotion. This paradigm shift is especially pronounced in the Micro, Small, and Medium Enterprises (MSME) sector, where businesses often grapple with the challenges of constrained resources and limited accessibility. In this context, the advent of websites has emerged as a game-changer for MSMEs, offering a powerful tool to overcome barriers to market expansion and revenue growth. A business's online presence, facilitated through a well-designed website, opens up unprecedented avenues for product promotion. This not only enables businesses to tap into a broader market but also streamlines the process for consumers seeking information about the products and services offered by these enterprises. In essence, a website serves as a dynamic platform for business actors to showcase their offerings, providing a faster and more accessible means for consumers to connect with relevant product information. Recognizing the pivotal role of websites in the contemporary business landscape, this research endeavors to contribute to the optimization of marketing strategies for MSMEs. By employing the Waterfall methodology and leveraging the capabilities of WordPress software, the aim is to craft a robust marketing website that aligns with the specific needs and objectives of these enterprises. Through this initiative, the research seeks to empower MSMEs, enabling them to harness the full potential of digital platforms for effective and efficient product promotion in an ever-evolving marketplace.

Keywords: Website, Kuyngebasreng, WordPress, Waterfall

1. Introduction

The development of the times towards modernization and advancements in technology in the era of globalization require every individual to understand modern information technology to obtain information [1]. One sector that has seen significant growth in technological development is the snack food industry, where it plays a role in distributing information about specific types of snacks in a particular area through internet technology [2]. Cilongok, Banyumas has many snack vendors, but not many people are aware of the various snack sellers in that area.

Kuyngebasreng is one of the SMEs (Small and Medium Enterprises) in Banyumas, Central Java, specifically located in Cilongok Village [2]. Kuyngebasreng specializes in producing fried meatballs or commonly known as "basreng" [2]. These snacks are made from raw materials such as mackerel fish and originate from Bandung, West Java [2]. The people in Bandung, especially the youth, are fond of this snack. Kuyngebasreng offers variants such as Spicy Orange Leaf Basreng, Original Orange Leaf Basreng, and Sweet Balado Basreng [2]. The purpose of establishing this business is to provide delicious and high-quality snacks to customers in and around Banyumas, and to expand its market reach even further [2]. Information about places or food stalls would be more widely known if there is a platform for exchanging information through an information system or website.

The information system/website is built or designed using WordPress software [2]. WordPress itself is a flexible Content Management System (CMS) for creating a website due to its open-source nature, making it easy to get updates and install various plugins or themes on this platform [2]. The website is designed to serve as a medium to promote the

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products or unique local foods sold at the food stall, making them more widely known to the community, both in Cilongok and beyond [2].

Previous researchers have conducted studies on website development to expand marketing reach with different problem scopes and objectives [1] [4]. This research, conducted at Kuyngebasreng's production site in Cilongok, aims to design an information system, namely a website, to help the owner overcome the narrow marketing reach, achieve sales targets, and facilitate the community in purchasing basreng without having to visit the location [2] [6]. A previous study by Riska Feni Aryanti on the Design and Development of a Web-Based Marketing Information System for UMKM (Micro, Small, and Medium Enterprises) at Batik Tulis Mbah Jo in Pilangkenceng aimed to market and facilitate the purchase of batik products without visiting the location [7]. This study used the SDLC (Software Development Life Cycle) method with the waterfall approach, PHP programming language, XAMPP as a web server, and MySQL for the database [4][7].

The current study differs in terms of the software used to create the website [6]. Previous researchers have conducted various studies on sales information systems with different objectives and topics [3] [5]. This study focuses on the development of a web-based shoe sales information system to improve customer service and simplify the shoe purchasing process [6]. The research uses the SDLC method with the waterfall approach, PHP programming language, and MySQL [6]. These programming languages are incorporated into Adobe Dreamweaver CS3 and XAMPP as a web server [6]. The results show that the research can address current business competition, especially in shoe sales, covering all aspects of transactions from order processing to data product storage, modification, and deletion, providing fast, accurate, and attractive information for customers [6].

2. Literature Review

2.1. Globalization, Technology, and Information Access

In the contemporary landscape, characterized by the intricate interplay of globalization and technological advancement, the seamless access to information has become a hallmark of societal progression. Globalization, the process of interconnectedness between economies and cultures, has been significantly accelerated by the rapid evolution of technology. This interconnectedness has necessitated a fundamental shift in how individuals access and assimilate information. The mastery of modern information technology has emerged not merely as a transient trend but as an essential skill set vital for societal participation in the 21st century. As the world becomes increasingly digitally connected, the ability to navigate this dynamic informational ecosystem becomes imperative, representing a crucial aspect of contemporary literacy.

Moreover, the exponential growth of technology has not only facilitated information access but has also redefined how businesses operate and communicate. In this context, the integration of modern information technology becomes pivotal for individuals, businesses, and communities alike to thrive in an environment shaped by global connectivity and technological innovation.

2.2. Technological Growth in the Snack Food Industry

The snack food industry stands as an exemplar of the transformative impact that technology has had on traditional business sectors. Far beyond being a culinary evolution, the industry has embraced and leveraged technology to reimagine its marketing strategies. Internet technology, in particular, has emerged as a powerful tool for businesses to efficiently disseminate information about specific snacks [2]. Online platforms have become indispensable conduits for showcasing the uniqueness of snack offerings, connecting businesses with consumers on a global scale. This evolution signifies not only a shift in the way snack businesses operate but also a testament to the adaptability and resilience of traditional industries in the face of technological disruption.

Furthermore, the growth of technology in the snack food industry reflects a broader trend where businesses leverage digital platforms to establish their brand presence, engage with customers, and expand their market reach. The integration of technology in this industry is not merely a matter of survival but a strategic imperative for businesses aiming to stay relevant and competitive in an era defined by digital connectivity and consumer engagement.

2.3. SMEs in the Snack Food Industry: A Case Study of Kuyngebasreng

Within the vast landscape of the snack food industry, the case study of Kuyngebasreng, a Small and Medium Enterprise (SME), unfolds as a compelling microcosm of traditional businesses navigating the intersection of tradition and technology. Situated in Cilongok, Banyumas, Kuyngebasreng's specialization in fried meatballs, or "basreng," encapsulates the aspirations of SMEs aiming to transcend local boundaries and achieve recognition beyond immediate geographic confines. The juxtaposition of traditional culinary practices with the utilization of technology underscores the delicate balance SMEs strike as they seek to preserve their cultural roots while embracing the opportunities afforded by the digital age [2].

Kuyngebasreng's journey exemplifies the broader narrative of SMEs in adapting to the digital landscape, showcasing the challenges and opportunities they encounter in their quest for market recognition. As technology becomes increasingly ingrained in business practices, SMEs such as Kuyngebasreng serve as valuable case studies, shedding light on the nuances of local businesses' endeavors to navigate the complexities of a globalized and technologically advanced market.

2.4. Information Systems in SMEs: Lessons from Previous Studies

Research exploring the implementation of information systems in Small and Medium Enterprises (SMEs) provides valuable lessons for businesses seeking to overcome inherent marketing limitations. Notable among these studies is the work conducted by Riska Feni Aryanti, focusing on the design and development of a web-based marketing information system for UMKM [7]. This research underscores the transformative role of technology in expanding the market horizons of SMEs, providing them with tools to thrive in an increasingly competitive digital landscape. The study serves as a testament to the potential of well-designed information systems to act as catalysts for market expansion, offering SMEs a means to compete effectively and assert their presence in the digital marketplace.

These lessons from previous studies highlight the strategic significance of information systems for SMEs, not merely as tools for information dissemination but as comprehensive solutions to the multifaceted challenges faced by small businesses in the modern business environment.

2.5. Website Development and Marketing Strategies

Website development has emerged as a strategic linchpin for businesses seeking to broaden their market reach and enhance customer engagement. A comprehensive exploration of a study focused on web-based shoe sales information systems exemplifies the multifaceted role that websites play in contemporary commerce. Beyond serving as promotional platforms, these websites act as transactional hubs, facilitating efficient customer service and simplifying the purchasing process [6]. The study underscores the intricate interplay between technology and customer experience, emphasizing the pivotal role of websites in shaping the modern consumer journey.

As businesses increasingly migrate towards digital platforms, the strategies employed in website development become crucial determinants of success. The findings from studies on web-based sales information systems provide valuable insights into how businesses can leverage technology not only to attract customers but also to streamline the entire transaction process, creating a seamless and satisfying experience for consumers.

2.6. Software Choices and Development Methods

The selection of software and development methods assumes paramount significance in shaping the efficacy of information systems. While some studies have favored the combination of PHP programming language, XAMPP as a web server, and MySQL for database management within the Software Development Life Cycle (SDLC) framework [4][7], others have explored the versatility of WordPress. Recognized for its open-source nature, WordPress facilitates seamless updates and plugin installations, making it a flexible and accessible choice for website development. This deliberate choice of software reflects the strategic alignment of technological tools with the objectives of the research, highlighting the importance of tailoring technology choices to the unique needs and goals of a specific project.

The landscape of software choices and development methods is dynamic, with each approach offering its own set of advantages and considerations. The nuanced decision-making process involved in selecting the appropriate tools for information system development contributes to the evolving discourse on the best practices in technology integration for businesses.

3. Methodology

Based on the background that has been outlined, this research was conducted on the SME (Small and Medium Enterprises) Kuyngebasreng located in Cilongok Village, Banyumas, Central Java. The research object is the website component, and the research method applied in this study is the Waterfall method. The Waterfall method is a systematic and sequential model used in research because it presents stages one by one in a sequence that is very suitable for field conditions, as seen in Figure 1 of the Waterfall method [7]. Waterfall itself is related to pure scientific research and the process of developing applications in the field of technology. The Waterfall method is also the earliest SDLC (Software Development Life Cycle) approach used for software development [7].

The waterfall model, or waterfall model, is often referred to as the website interface, known as web design or user interface (UI) design, which refers to how the website is presented to users. Examples include layout, color, typography, graphics, images, icons, and navigation used in website design [7]. The purpose of a website interface is to facilitate navigation and ensure that the website is attractive, informative, and user-friendly.The research method section contains information about the stages of research conducted. It is advisable that these stages be depicted in the form of a block diagram or a similar flowchart illustration of the research stages to facilitate understanding of the proposed method. In this stage, it should be explained regarding research data, research process stages, and evaluation stages carried out to measure the success of the research conducted [7].

Instance verification is crucial in validating the proposed method. For instance, in the orthopedic video calculation method of concrete bridge cracks, using Visual C++ 6.0 language programming, a more reasonable crack image processing algorithm was employed to achieve bridge crack monitoring based on image technology [7].

This paper took actual bridge cracks as the test object, and 15 bridge images taken by digital cameras were verified. The crack width measured with a crack observer was compared with the experimental values [7]. The results suggest that the calculated crack width value is slightly larger than the measured value, with an error value within 0.05mm. When the crack width is above 0.3mm, the calculated crack width value is very close to the measured width value, with an error within the range of 0.2%. When the crack width is between 0.2 ~ 0.3mm, the error is within 10%. However, when the width of the crack is below 0.2mm, the relative error is greater than 30% [7].

It is stipulated in the Prestressed Concrete Bridges and Culverts Design Code (JTGD62-2004) that the full cross-section of the prestressed bridge under the short-term load effect combination and part of the prestressed class A (limited tensile stress) bridge under the long-term load combination Tensile stress is not allowed at the tensile edge, that is, vertical cracks are not allowed, and the maximum crack width allowed for reinforced concrete bridges and partially prestressed Class B (exceeding limit tensile stress) bridges under normal use conditions (class I or II ring The lower non-steel wire or steel strand prestress) is 0.2mm [7].

The "Code for Conservation of Highway Bridge Conservation" (JTGH11-2004) stipulates that vertical cracks in the beam body and longitudinal cracks in the beam body are not allowed for fully prestressed or partially prestressed Class A bridges. The maximum allowable width is 0.2mm, and the maximum permissible width of vertical cracks for reinforced concrete or partially prestressed Class B bridges is 0.25mm, and repair or reinforcement should be performed beyond this value [7].

Several studies have also utilized the Waterfall methodology in developing information systems. Nuraeni and Astuti discussed the design and development of an online sales system (E-Commerce) for a Batik store in Pekalongan using the Waterfall method [7]. Syaputra, Darussalam, and Winarsih applied the Waterfall method in the development of a laundry management system [8]. Nur explored the usage of the Waterfall method in designing an information sales system [9]. Lesmono developed a website for shoe sales using the Waterfall method [10]. Susilo focused on the design

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and development of an online store website using the Waterfall method [11]. Robin and Wasino presented the design of a resort reservation website using the Waterfall method [12]. Priskila and Senas discussed the application of the Waterfall method in developing an E-Catering website [13].

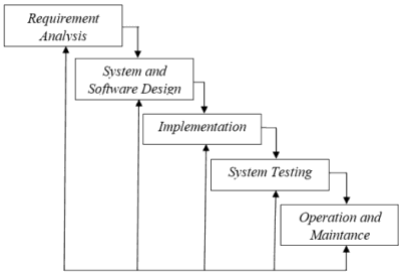

Figure 1. Waterfall Method

3.1. Requirement Analysis

The results of the analysis encompass several activities, such as evaluating issues, studying information about products in the Kuyngebasreng MSME and business development, as well as collecting data for research activities through interviews. Customer analysis is conducted to identify user needs and target markets [14-16]. Technological analysis is also performed to determine the type of website needed by the Kuyngebasreng MSME.

3.2. System and Software Design

2.2.1. Use Case Diagram design depicting user interaction with the website.

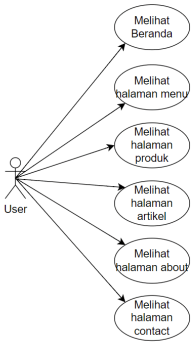

Figure 2. Use Case Diagram

2.2.2. Design an Activity Diagram to illustrate the activities of the system

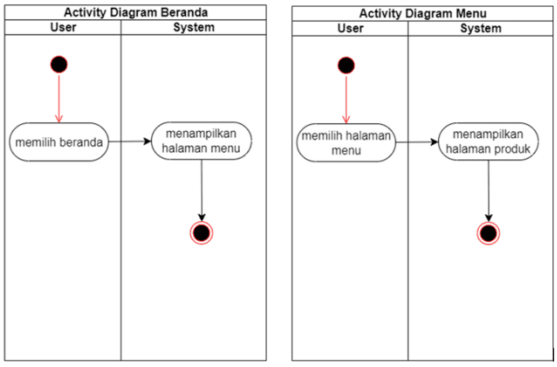

Figure 3. Home and Menu Activity Diagram

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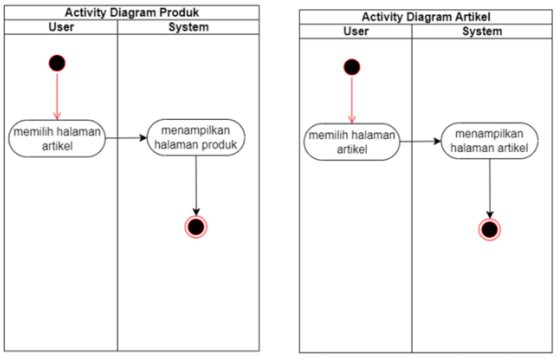

Figure 4. Activity Diagram of Products and Articles

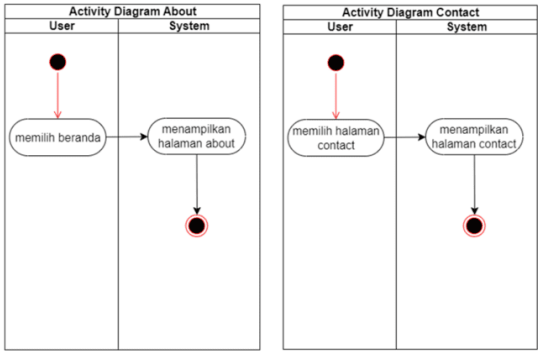

Figure 5. Activity Diagram About and Contact

2.2.3. Design the homepage interface of the Kuyngebasreng website

Figure 6. Kuyngebsreng Website

3.3. Implementation

In the implementation phase, the ideas that have been generated are translated into a programming language for coding. An open-source Content Management System (CMS), namely WordPress, is used to build program functions to align with user preferences, ensuring a fast and easy implementation [16,17]. The design of the Kuyngebasreng sales website involves 5 (five) components, namely:

a) Content Management System (CMS): WordPress, an open-source CMS, is used for website design. One of its advantages is the content management system.
b) Template System: Elementor. The advantage of the Elementor template is its customized layout for website appearance and a drag-and-drop interface that helps save time.
c) Market System: WooCommerce. The website admin has full control over all E-commerce needs or can remove unused extensions.
d) Hosting System: epizy.com Used to store Kuyngebasreng website data such as images, files, and databases.
e) Domain System: http://kuyngebasreng.epizy.com

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3.4. System Testing

In their rigorous examination of the website's functionality, researchers harnessed the power of various technological tools, including computers, laptops, and smartphones. Employing Google Chrome as the server added an extra layer of scrutiny to their testing process. The scope of their investigation encompassed a comprehensive analysis of user interface pages, menu pages, product pages, article pages, about pages, and contact pages. This meticulous approach allowed the researchers to uncover and pinpoint any bugs, errors, or defects that might compromise the website's performance or user experience [18,19]. Armed with this valuable information, the researchers swiftly implemented necessary corrections, ensuring that the website not only met but exceeded its intended functionality and user satisfaction goals.

3.5. Operation and Maintenance

In the waterfall development process, maintenance constitutes the final stage [20]. At this juncture, users engage with the operational application, and the system undergoes updates to accommodate new requirements and address any encountered errors. Maintenance is crucial to ensure the smooth operation of the application and compliance with evolving user needs and business environments [21]. During this phase, the development team focuses not only on bug fixes but also on enhancing performance, security, and functionality to keep the application relevant and effective in the face of continual changes [22,23]. With a well-planned maintenance process, the application can continue to evolve, providing added value to users and the organization as a whole.

4. Result and Discussion

The Results and Discussion section serves as a crucial segment within the research document, presenting a comprehensive account of the study's findings and their alignment with the predetermined research objectives established in the introduction. This section not only unveils the raw data obtained through the research but also delves into a thorough analysis of these findings. By establishing a logical connection between the data and their corresponding discussions, the section aims to provide readers with a coherent narrative that facilitates a deep understanding of the research outcomes. This careful intertwining of information and analysis guides the reader towards a focused and insightful conclusion, allowing for a nuanced comprehension of the implications and significance of the study's results in relation to the initial research goals. Thus, the Results and Discussion section plays a pivotal role in bridging the gap between data collection and the formulation of meaningful conclusions, ultimately contributing to the advancement of knowledge in the respective field of study.

4.1. Landing Page

The landing page of the Kuyngebasreng website is designed to capture the attention of visitors and present essential information clearly. This includes attractive design elements, informative text, and often clear calls to action to encourage visitors to purchase products from Kuyngebasreng. Furthermore, it is linked to the business owner's contact number to facilitate customers in placing orders.

Figure 7. Main Page

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4.2. Menu

The user-friendly design of the Kuyngebasreng website extends beyond its captivating menu display. Navigating through the website is a delightful experience, with a seamless blend of enticing visuals and informative content. The images of basreng not only serve as eye-catching elements but are complemented by detailed descriptions that provide insights into their origin, flavor profiles, and unique features. The product galleries, arranged in a clear and appealing manner, showcase the diverse range of basreng offerings, making it easier for customers to explore and make informed choices.

What sets the Kuyngebasreng website apart is its commitment to providing an optimal user experience. The layout is not only aesthetically pleasing but also responsive, ensuring that users can effortlessly browse the site across various devices. This attention to detail reflects the brand's dedication to customer satisfaction and user convenience.

Moreover, the website's integration with social media and WhatsApp adds another layer of connectivity to the Kuyngebasreng business. Customers can easily share their favorite basreng selections on social platforms, contributing to word-of-mouth marketing and expanding the brand's online presence. The direct link to WhatsApp facilitates real-time communication, allowing customers to inquire about products, place orders, or seek assistance, fostering a more personalized and efficient interaction.

In essence, the Kuyngebasreng website goes beyond being a mere online menu; it is a well-crafted digital hub that seamlessly combines aesthetics, functionality, and connectivity to enhance the overall customer experience and promote the brand's presence in the digital landscape.

Figure 8. Kuyngebasreng Description

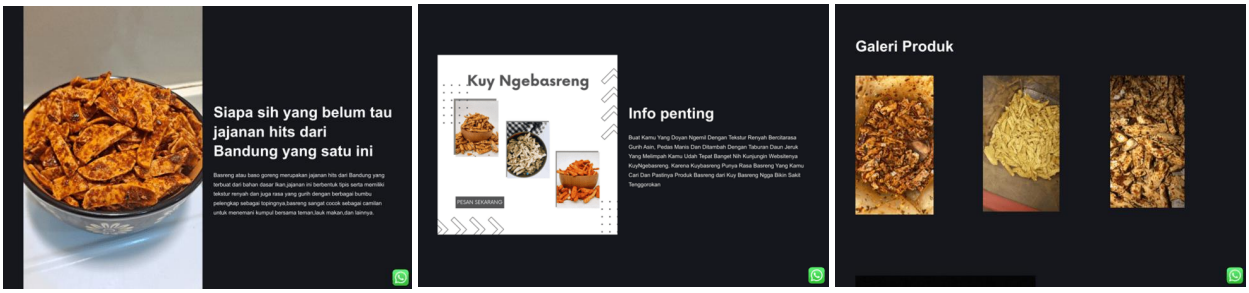

Figure 9. Product Promotion Description and Gallery

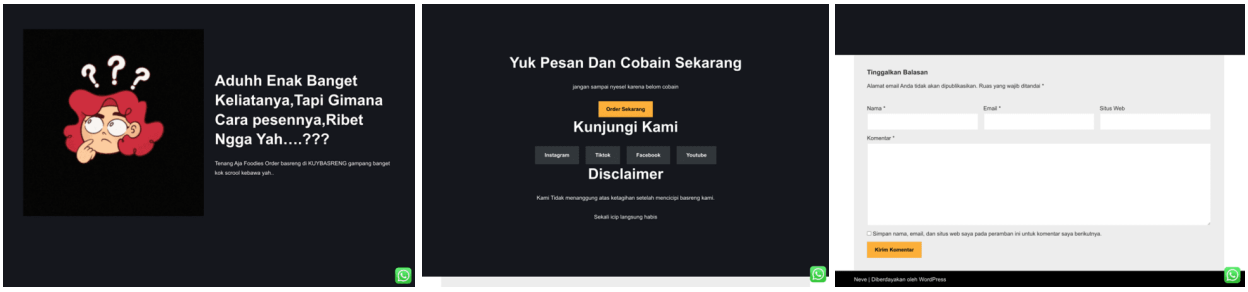

Figure 10. Consumer FAQs, Order Page and Mail Page

4.3. Products

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The product menu on the Kuyngebasreng website serves as an enticing gateway to the diverse array of offerings, providing users with a visually appealing and informative showcase of Kuyngebasreng's products. Each item is accompanied by comprehensive details about its flavors, ensuring that customers can make well-informed choices based on their preferences. Furthermore, the transparency in pricing adds another layer of convenience, allowing users to navigate the website with ease and confidently select products that align with their budget. To foster a dynamic and interactive user experience, the inclusion of a feedback box becomes pivotal. This feature not only encourages users to share their thoughts and opinions directly but also streamlines the feedback process, making it accessible and user-friendly. By facilitating direct communication, Kuyngebasreng not only enhances customer engagement but also demonstrates a commitment to continuous improvement based on valuable user insights.

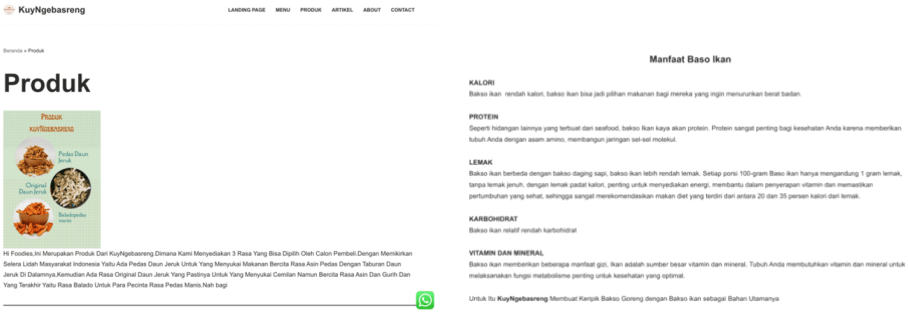

Figure 11. Product Description

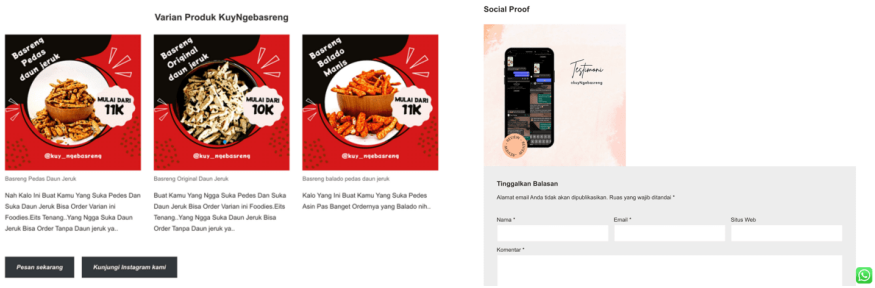

Figure 12. Product Variants and Testimonials

4.4. Article

The article menu display on the Kuyngebasreng website provides easy access to various content presented in the form of articles. It includes clear and easily understandable categories such as the latest news, guides, tips, opinions, or other categories relevant to the website's topic or focus. The design makes it convenient for visitors to find the desired articles with an organized and intuitive arrangement. Additionally, the article menu should ideally be equipped with a search feature that facilitates users in finding articles based on specific keywords or topics. The article menu on a website offers easy access to various content presented in article form. A good article menu display should include clear and easily understandable categories, such as the latest news, guides, tips, opinions, or other categories relevant to the website's topic or focus. The design makes it easy for visitors to find articles of interest to read.

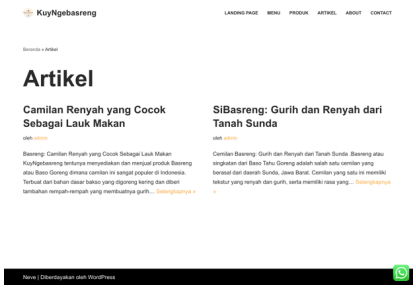

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Figure 13. Kuyngebasreng Article

4.5. About

Figure 14. About Kuyngebasreng

4.6. Contact

The Contact display plays a crucial role in providing comprehensive information to website visitors, serving as a centralized hub for various communication channels. Within the contact menu, users can easily access essential details such as email, physical address, social media profiles, and WhatsApp information. Notably, each of these contact points is seamlessly linked to the owner of Kuyngebasreng, facilitating efficient and direct communication between the website's audience and the proprietor. This integrated approach not only enhances user experience but also underscores the website's commitment to accessibility and transparency, fostering a stronger connection between Kuyngebasreng and its visitors.

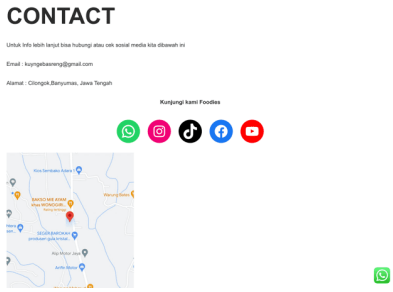

Figure 15. Contact Kuyngebasreng

5. Conclusion

The result of this research is the design and development of the Kuyngebasreng website using WordPress software and employing the Waterfall method. With this website, the owner of Kuyngebasreng can easily promote their business by sharing the website link on various social media platforms. Additionally, consumers can find it more convenient to make purchases through the website, where clicking on the product will directly link to Kuyngebasreng's social media and WhatsApp. Additional recommendations for this research include creating product availability descriptions, conducting promotions with discounts, and generating more articles relevant to the products.

6. Declarations

6.1. Author Contributions

Conceptualization: E.G.M. and F.I.K.; Methodology: F.I.K.; Software: E.G.M.; Validation: E.G.M. and F.I.K.; Formal Analysis: E.G.M. and F.I.K.; Investigation: S.N.F.; Resources: S.S.A.; Data Curation: S.N.F.; Writing Original Draft Preparation: S.N.F. and T.; Writing Review and Editing: S.N.F. and T.; Visualization: T. All authors, E.G.M., F.I.K., S.N.F., S.S.A., and T., have read and agreed to the published version of the manuscript.

6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.3. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.4. Institutional Review Board Statement

Not applicable.

6.5. Informed Consent Statement

Not applicable.

6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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